We often learn elementary school math as a bunch of rules, without really understanding the concepts. Now that you're working on a higher level, a really good grasp of those basic ideas will help form a firm foundation for remembering the things you're encountering now.

If you understand how fractions (rational numbers) work, then working with rational expressions is much easier.

FRACTIONS:
What they are and why we have them

*JUST WHAT **IS** A FRACTION?*

A fraction is a **part** of something. One half of a pie is *one* piece of a pie that has been cut into *two* pieces. In other words:

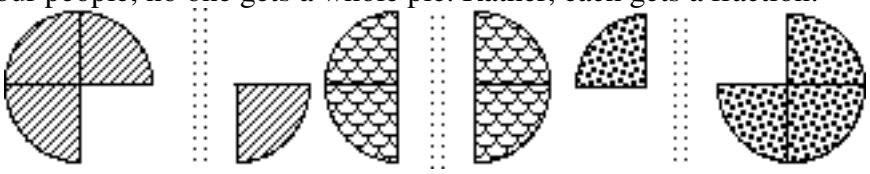
$$\frac{1}{2} \text{ is } \frac{\text{how many you have to work with } (\textit{numerator})}{\text{how many are in a whole } (\textit{denominator})}.$$

Two handy facts to keep in mind: $\frac{\text{any number}}{\text{itself}} = 1 \quad \left\{\frac{a}{a} = 1\right\}$ (You have all the pieces of the pie.)

and $\frac{\text{any number}}{1} = \text{itself} \quad \left\{\frac{a}{1} = a\right\}$ (The pies are all in one piece.)

FRACTIONS AND DIVISION

Fractions are really just another way of writing about and dealing with division. If I have three pies, and divide them equally among four people, no one gets a whole pie. Rather, each gets a fraction:



In the picture, each person has *three* pieces out of the *four* that each pie was cut into.

Mathematically, "3 pies divided among 4 people" is written as

$$3 \div 4 = \frac{3}{4} \quad \left(\text{or } 3/4\right).$$

KINDS OF FRACTIONS

In **proper** fractions the numerator is smaller than the denominator: $\frac{3}{5}$.

In **improper** fractions the numerator is larger than the denominator: $\frac{5}{3}$.

In **mixed numbers** there is a whole number part and a fraction part: $1\frac{2}{3}$.

(Once we get to algebra, and beyond, improper fractions are used rather than mixed numbers.)

FINAL ENCOURAGEMENT

We deal with fractions all of the time, whether it's "two and a third cups" in a recipe, or knowing that 25 cents is a "quarter" of a dollar. Knowing what makes fractions tick is more than **half** the battle!